

Flight Scientist Report
Wednesday 6/30/2021 ACTIVATE RF93

Flight Type: Statistical Survey Flight
Flight Route: KFLI-ECG-OXANA-ATUGI-3610N07045W-ZIBUT-ATLIC-KLFI
Special Notes: lots of ships

King Air

Pilot report (Wusk):

Planned as second flight of a UC-12 double flight day; cooperative flight with the HU-25. Planned route: KFLI ECG OXANA ATUGI 3610N07045W ZIBUT ATLIC KFLI. UC12 takeoff from runway 26 ahead of HU-25. Good ATC departure and climb to FL280. Generators held a good balance. Profile out AR8, to OCEANIC control, back to ATLIC was nominal. Started the descent into Langley just prior to ATLIC. ATC gave vectors for a VISUAL 26. Normal landing at KFLI, runway 26. 4x dropsondes deployed. Good coincidence throughout flight. Crew was Delaney, Wusk, Shingler. Last flight of the Summer 2021 campaign.

Flight scientist report (Shingler):

Minor cirrus encountered over EVG before the Outer Banks. A few individual lines of convection were seen before OXANA with tops of individual lines reaching 8k, 7k, and 14k ft. First sonde was dropped at OXANA. Light scattered shcu seen after OXANA with relatively uniform tops at about 2kft. Second sonde dropped halfway between OXANA and the eastern turn point. There was a cloud clearing feature between the eastern most turn point and ZIBUT with reasonable scattering up to about 2kft. Third sonde was dropped in the clearing. A line of convection surrounding the clearing had tops reach 12kft. Scattered shcu before ZIBUT seen between 1-3 kft. Fourth sonde dropped and ZIBUT and fifth sonde dropped at ATLIC.

Falcon

Pilot report (Baxley):

Takeoff (Z): 1712 / Land: 2035

Science flight for the HU-25 in support of ACTIVATE Campaign #4, conducted cooperatively with the UC-12. Route of flight planned for KFLI-ECG-OXANA-ATUGI-3610N07045W-ZIBUT-ATLIC-KLF. Departed Rwy26 with left turn direct to ECG, climbing at 5k ft MSL for initial transit, then descending to 500' MSL once over water and in international airspace. Winds were moderate (<20kts) out of the west throughout the flight, with clouds primarily east of ZIBUT and 1000' – 7000' MSL. Time coordination with the UC-12 was always within 10 minutes, and usually less than 2 minutes. All objectives were achieved and with no discrepancies noted, with the exception of no auto-pilot heading hold for the HU-25.

Pilots: Elder/Baxley

QNCs: Ziemba/Winstead

Flight scientist report (Ziemba):

Route: Around the horn, counterclockwise.

Clouds:

- Generally patchy weak convective cumulus throughout track at 1500-2500ft. Some more organized convergence lines of cloud with tops at 6-7000ft altitude. Similar to morning flight conditions.

Aerosol:

- Fairly clean aerosol conditions associated with sub-tropical high. Mostly sulfate from on-board AMS measurements. Coastal number concentrations were higher than over water, as has been typical throughout deployment.

Flight notes:

- Chose to stay at 5000ft for transit to E. City. Some lateral movement to sample a few Cu over land. Looks like this altitude was in/out of a layer as aerosol properties were quite variable.
- Clear#1: shortened to set up for cloud ensemble. ABL leg done in weak residual layer conditions.
- Cloudy#1: Did not get a good BCT, once we got up to the right altitude (~7500ft) there were not good clouds on our line. Was able to sample a cloud top at 6000ft on decent.
- Cloudy#2: Left CVI on too long during ACB/BCB pairs (ugh!). BCT/ACT done at the same altitude.
- Cloudy#3: Cloud base moved between first and second ACB/BCB pair, adjusted heights. Extended second ACB after getting skunked, ended up finally getting a nice sample. Did not get a BCT since cloud thickness was not suitable. Rain at 19:28/19:29.
- Clear#2: did have puffy-Cu, but timing didn't work for an ensemble.
- Clear#3+4: did level legs in residual layers, fairly complicated aerosol so could not track any distinct layers.

Eddie:

17:13:33 Takeoff

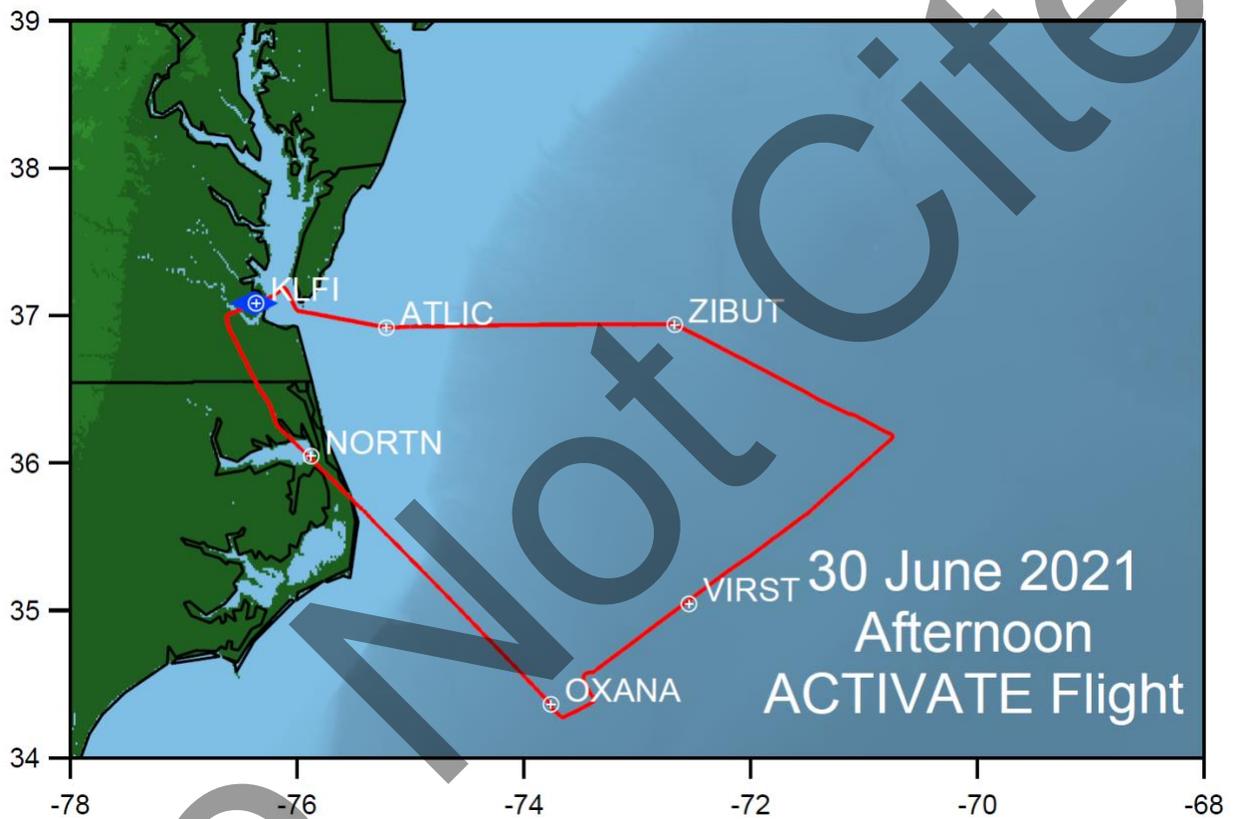
17:37 Ultrafine CPC showing potential signs of getting water contamination in butanol due to high ambient RH.

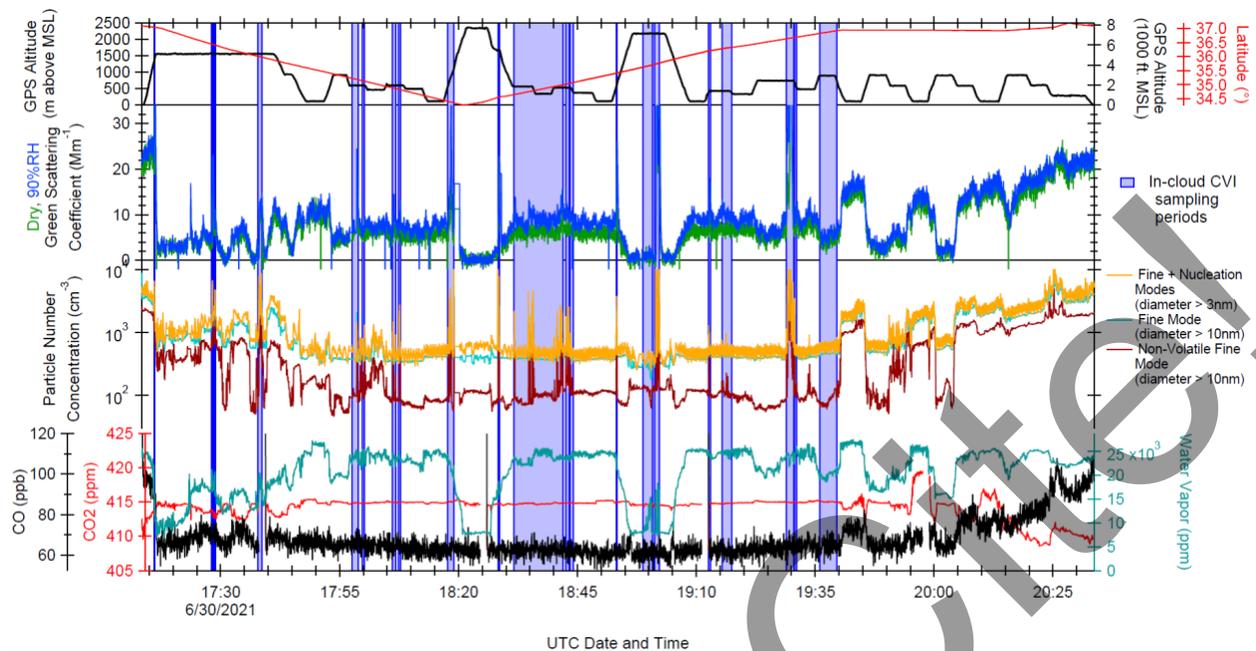
17:59 Ultrafine CPC having sample flow issues due to getting too hot. Flows oscillating. Cabinet temperature is 48 C.

19:50:30 to 19:55 In clear air; Spikes in CPC concentrations @ 2000 ft. Lots of ships in area.

20:25 WCM & humidifier turned off in preparation for landing.

20:33:48 Landing





Do Not

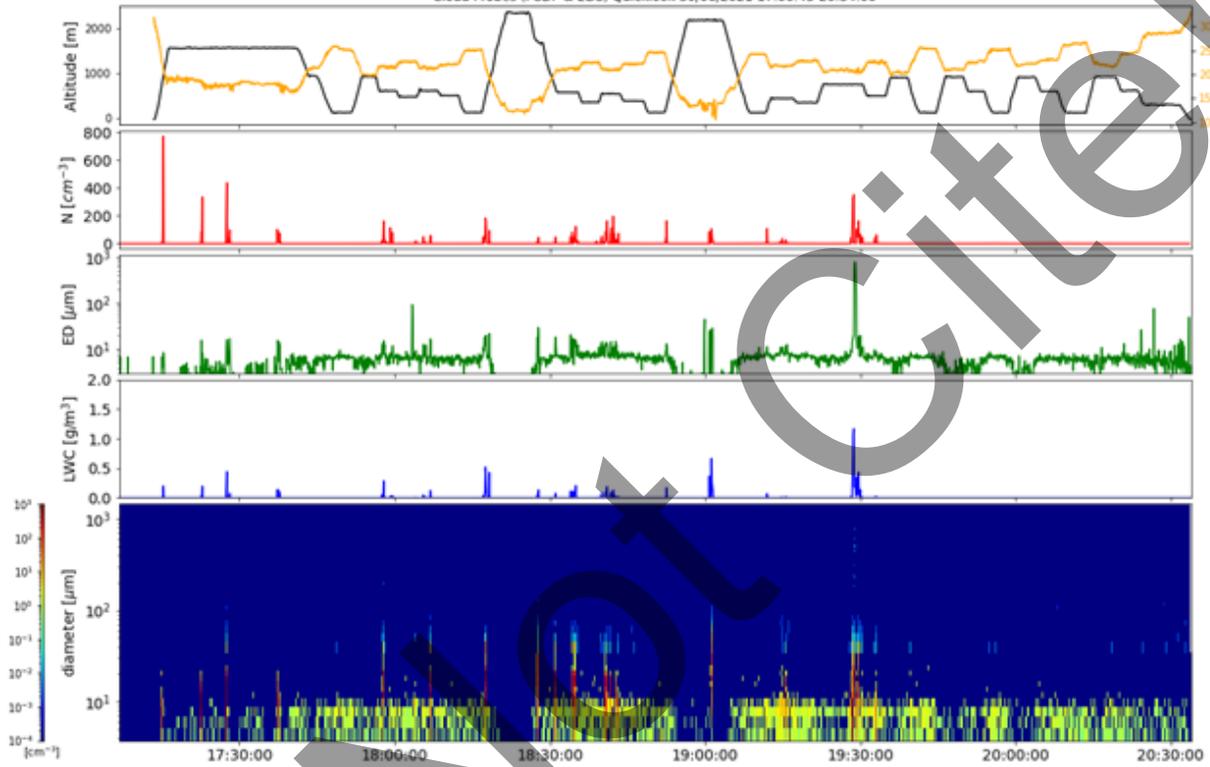
Quicklook ACTIVATE Cloud Probes (FCDP & 2DS) Quicklook

preliminary data, only for quicklook use

Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie



Cloud Probes (FCDP & 2DS) Quicklook 30/06/2021 17:06:43-20:34:00

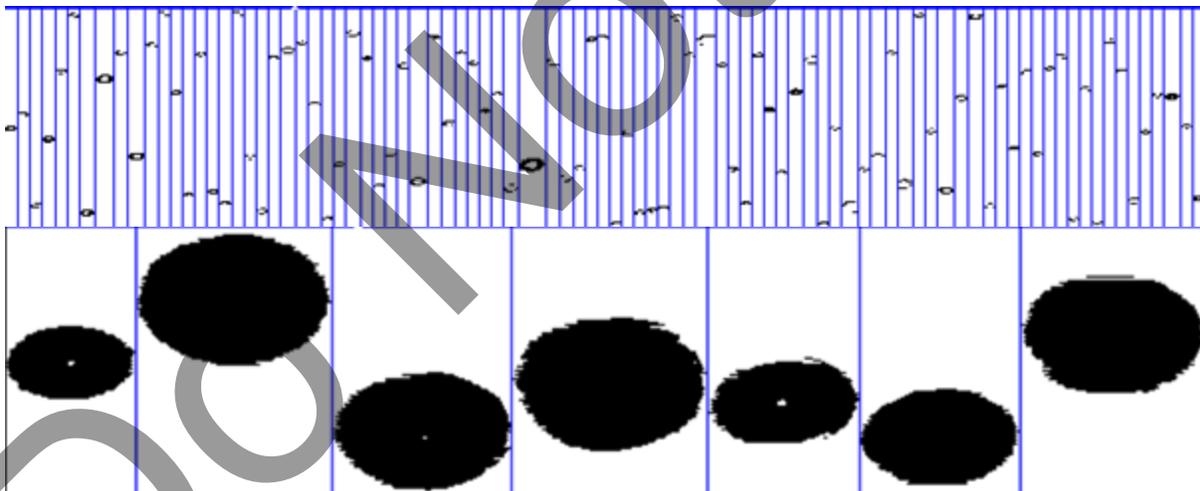
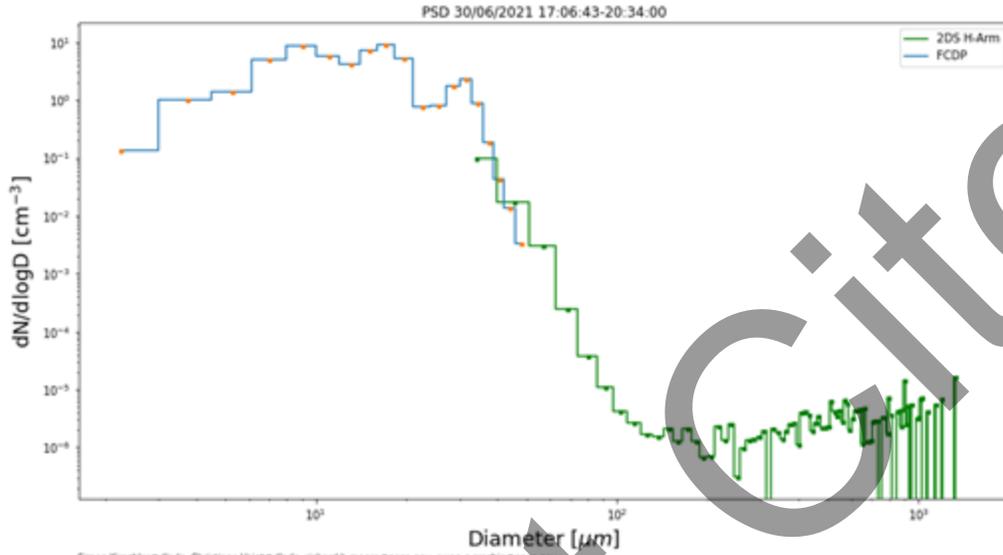


Simon.Kirschler@dlr.de, Christiane.Voigt@dlr.de, Richard.h.moore@nasa.gov, ewan.c.crosbie@nasa.gov

Do Not Cite

PSD ACTIVATE

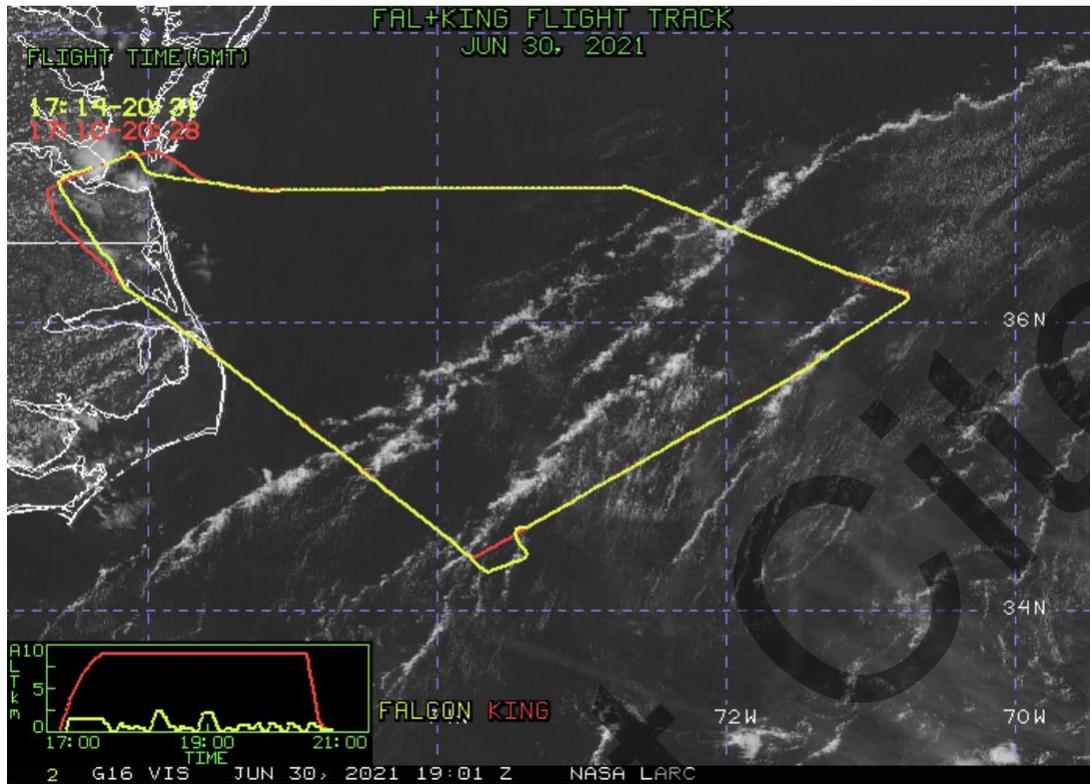
preliminary data, only for quicklook use
Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie



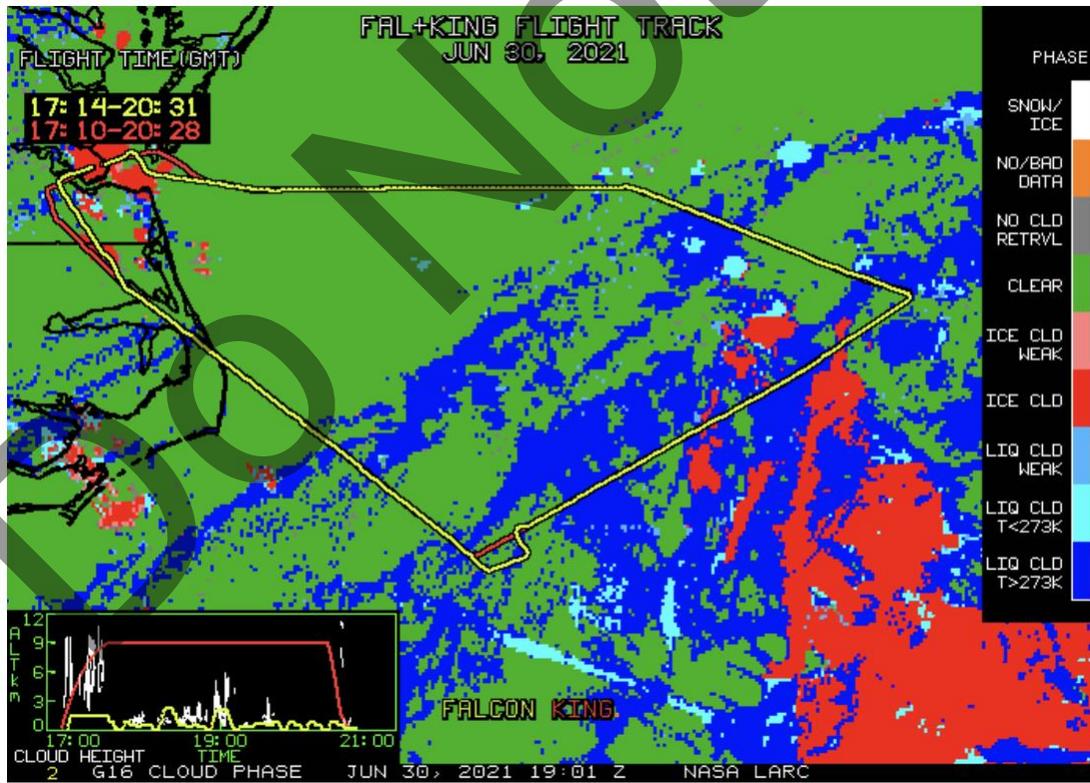
Only pure liquid clouds with mainly drizzle and precip around 19:29 UTC.

NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 93, 19:01 UTC Jun 30, 2021

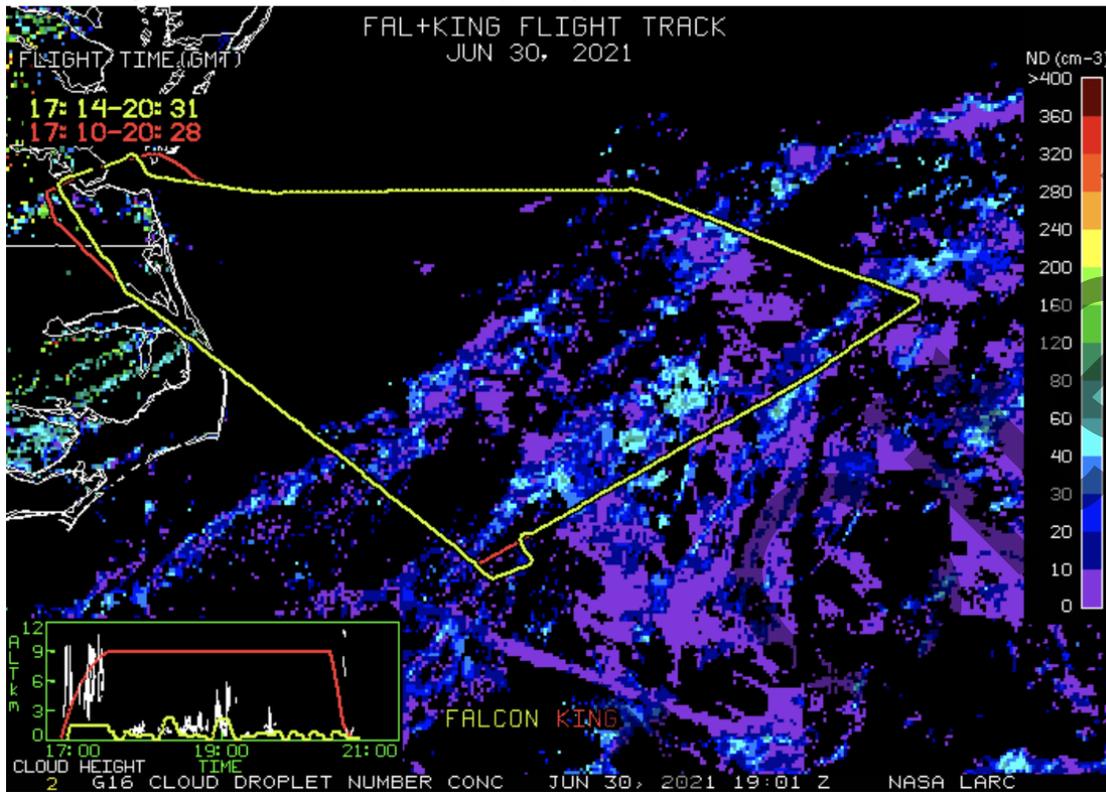
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)

